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F-6690



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant : Masami UEDA, et al.
Serial No. : 09/700,566
Filed : November 15, 2000
For : MARAGING STEEL EXCELLENT IN FATIGUE
CHARACTERISTICS AND METHOD FOR
PRODUCING THE SAME
Group Art Unit : 1742
Examiner : Janelle Combs-Morillo

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C. Bruce Hamburg
(Name)

(Signature)

Assistant Commissioner for Patents
Washington, D.C. 20231

REQUEST FOR RECONSIDERATION

Sir:

This is responsive to the Office Action of April 10, 2002.

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Reconsideration of this application is respectfully requested.

Applicants wish to thank the Examiner in charge of the application for the courteous and helpful interview given on June 4, 2002. At the interview, the Examiner requested that applicants submit in writing the arguments presented so that they can be considered more fully before any decision is made concerning the patentability of the claims.

Claims 1,3 and 4 have been rejected under 35 U.S.C. 103(a) as being unpatentable over JP 10-193038 (JP'038), which is the only rejection in the Action.

JP '038 discloses a maraging steel composition containing various elements with concentration ranges which overlap those recited in claims 1 and 3. However, there does not appear to be any disclosure in the reference of a N content of 0.003% or less, an O content of 0.0015% or less (recited in both claims 1 and 3 of our application), Ti and Mo component segregation ratios in the structure of 1.3 or less each (recited in our claims 1 and 4), or a nonmetallic inclusion having a size of 30 μm or less (recited in claim 3 with a definition of the size and included in claim 4 which is dependent from claim 3).

It is acknowledged in the Office Action that the segregation ratio for Ti or Mo and the nonmetallic inclusion size are not disclosed in JP '038 but the action attempts to explain this away by stating on page 2 that "products of identical chemical composition can not have mutually exclusive properties. ... A chemical composition

and its properties are inseparable. Where the claimed and prior art products are identical or substantially identical in structure or composition, or are produced by identical or substantially identical processes, a prima facie case of either anticipation or obviousness has been established. ... Therefore, if the prior art teaches the identical chemical structure, the properties applicant discloses and/or claims (such as segregation ratio and nonmetallic inclusions) are necessarily present.”

It is submitted that this position is not well taken. It is noted for example, that two alloys containing the same concentrations of certain specified components, unlike single specific chemical compounds, are not necessarily identical substances with the same properties, since the alloys are not defined only by the specified components and their concentrations, but also by the distribution of the components in the alloy as indicated, for example, by segregation ratios, the crystal structure of the components, and the nature and structure of components not specified in the description of the composition, for example, the size of the nonmetallic inclusions, any of which may be different in different alloys. Moreover, even substances having the same chemical formula may have different properties because of their different crystal structures as in the case, for example, of alpha, beta and gamma alumina (Al_2O_3) and the amorphous, graphite and diamond forms of element carbon.

In particular, with respect to the situation involved in the rejection, as previously stated, there is no indication in the disclosure of JP '038 that the maraging


steel obtained as described therein have Ti and Mo segregation ratios each of which is 1.3 or less as recited in our claims 1 and 4 and/or that the size of the non-metallic inclusion contained in such steel is 30 μm or less as recited in our claims 3 and 4. Furthermore, these claimed characteristics of applicants' maraging steels are not merely arbitrary but are instrumental in obtaining steels with very desirable fatigue strength as shown in the entries of Tables 2 and 3 on pages 27 and 28 and Figure 1 of the specification regarding the segregation ratios of Ti and Mo, and the entries of Tables 12 and 13 on pages 34 and 35 and Figure 10 of the specification, with regard to such segregation ratios and the size of nonmetallic inclusions.

Finally, it should be noted that applicants' claimed steel and the steel of JP '038 are not produced by "identical or substantially identical" processes as stated in the portion of the Office Action quoted previously since the JP '038 disclosure does not include a process comprising a soaking step at 1100-1280°C for a total hot holding time of 10-100 hours before plastic working the forged piece, which is critical for obtaining Ti and Mo segregation ratios of 1.3 or less, as pointed out on page 4, last three lines of the specification, or the combination of conditions including the utilization of a composition containing 0.003% or less of nitrogen and 0.0015% or less of oxygen and casting an ingot with specific dimensions, to obtain a nonmetallic inclusion of 30 μm or less, as shown on page 4, lines 1-5, and page 6, line 10 to page 7, line 6 of the specification.

The application is now thought to be in condition for allowance, and such action at an early date is earnestly solicited.

Respectfully submitted,

Jordan and Hamburg LLP

By 
C. Bruce Hamburg
Reg.No. 22,389
Attorney for Applicants

Jordan and Hamburg LLP
122 East 42nd Street
New York, New York 10168
(212) 986-2340